Bits and Bites

for learning about Alberta pulse nutrition, food and farming

PULSE café

Student activities for Alberta health/wellness, language arts, science and social studies classrooms

GRADES 4 to 6

ALBERTA PULSE GROWERS

Welcome to the **PULSE café**! Enjoyed by many cultures around the world for thousands of years, pulses are an affordable, nutritious and versatile food. We hope that the **PULSE café** will encourage students to explore the nutrition, food and farming of this adaptable crop.

Alberta farmers are proud to grow pulses like dry beans, dry peas, lentils and chickpeas because they are good for the farm, for food and for you!

Did you know that the word "pulse" comes from the Latin word *puls* which means thick soup? Easy to prepare in a variety of dishes like hummus, chili, black bean brownies or split pea soup, pulses are high in protein and fibre and low in fat, making them the perfect fit for a balanced diet and busy lifestyle.

Alberta Pulse Growers represents the 6,500 farmers who grow pulses in Alberta. We are proud to support education and provide the **PULSE café** resources for teachers and students in Grade 1 to Grade 6 Health/Wellness, Language Arts, Social Studies and Science programs.

Alberta Pulse Growers thanks the farmers who have shared stories that are used in these resources.

FIND Alberta Pulse Growers

www.albertapulse.com/eating-pulses/
Facebook @albertapulse
Instagram @albertapulsegrowers

Pulses are the dry edible seeds of plants.

take a pulse

Pulses are connected to your health – in more than one way.

Your pulse is your heartbeat. A strong pulse is a sign of a healthy heart. Pulses are also plants. These plants provide food for people and animals.

Pulses refer to the dry edible seeds of plants in the legume family. A **legume** is a plant that has seeds and pods. Pulses include dry peas, lentils, beans and chickpeas.

Pulses provide fibre, folate, potassium and iron. Read on to find out more!

What is a nutrient? Use the nutrient descriptions to help you make your own definition.

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Why are nutrients important?

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Fibre is a carbohydrate that's only found in plant-based foods like fruits, vegetables, legumes, grains and nuts.

Your body does not break down or digest fibre. However, fibre is important to keep your digestive system healthy and working properly. Fibre also helps to keep our hearts healthy.

Folate is found in a wide range of foods including vegetables, legumes, eggs and fruit. Your body needs folate for energy and to grow.

Potassium is a mineral found in the foods you eat. It helps your muscles work, including the muscles that control your heartbeat and breathing.

Iron is a mineral that your body needs to develop and grow. Your body needs iron to carry oxygen from the lungs to all parts of the body. Beans, peas and lentils are rich in iron.

Pulses provide variety.

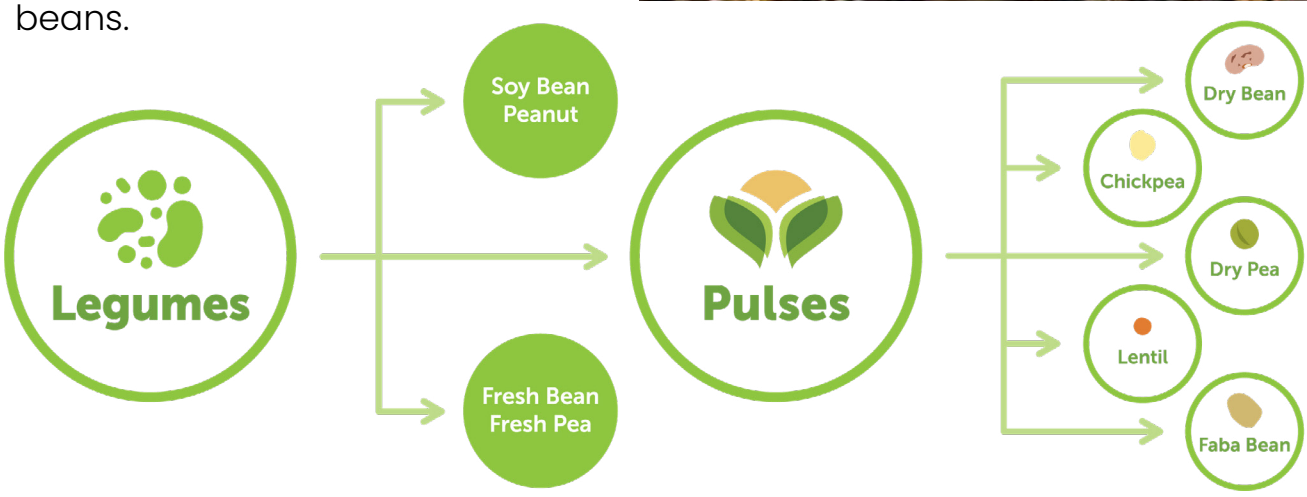
pulse variety

Pulses are part of the legume family of plants, but not the only member of this family!

Did you know that there are three different categories in the legume family?

1. Soybeans and peanuts contain protein and fibre, but they are **not** pulses because of their high fat content.
2. Fresh green beans, yellow beans and garden peas are **not** pulses because they have a high moisture content, are lower in protein and fibre and are harvested fresh, instead of dry.
3. Pulses are high in protein and fibre, but low in fat. They are harvested dry and include dry peas, dry beans, lentils, chickpeas and faba beans.

This photo shows what a dry bean crop looks like when it is ready for harvest.



pulse menu

Green field peas are small and round and have a sweet flavour.

Yellow peas are small and round. They have a milder flavour and are less sweet than green field peas.

Whole red lentils have a sweet and nutty flavour and do not need to be soaked before cooking.

Red split lentils change colour and lose their shape the longer they are cooked. They do not need to be soaked before cooking.

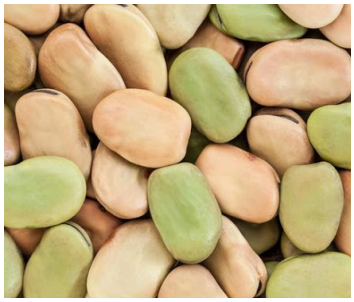
Green lentils are fast cooking and hold their shape when cooked. They have a bit of a peppery flavour.

Black beans are small and shiny. They have a white centre. These beans have a nut-like flavour.

Great Northern beans are a medium sized white bean and have a mild nutty flavour.

Pinto beans have reddish brown speckles of colour. They turn pink when they are cooked. The word pinto means *painted* in Spanish.

Kabuli chickpeas are large and beige coloured, with a thin skin. They have a nutty flavour. They are also known as Garbanzo beans.



Faba beans are also known as Fava beans or broad beans. They are large, flat beans with a light green and beige colour.

What makes pulses unique, or different, from other crops that are grown in Alberta and used for food?

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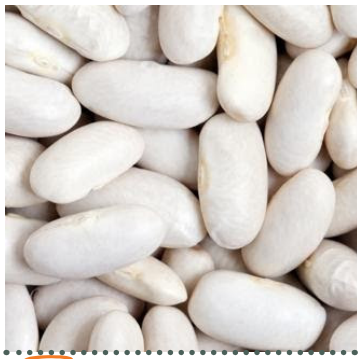
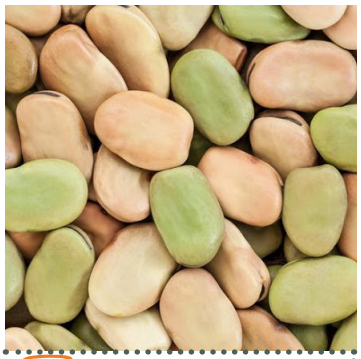
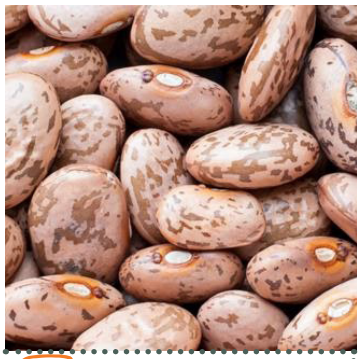
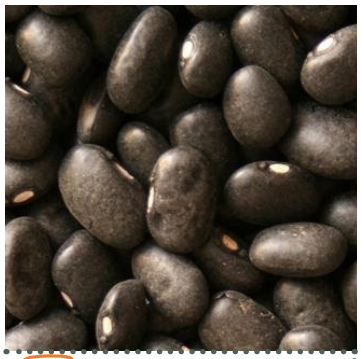
pick a pulse

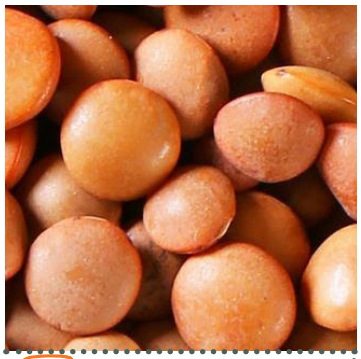
Pulses are on the menu! Can you name each of these pulses by memory? Write the name of each pulse in the box. Challenge yourself further by describing one characteristic of each pulse with its name!











Nutrients are substances the body needs.

nutrients on the menu

Foods are made up of a combination of carbohydrates, protein, fat and water. These **nutrients** are the building blocks of all food. Like puzzle pieces come together to make a picture, nutrients come together to make food.

Nutrients allow our bodies to make energy for fuel and build muscles and other body tissues. Nutrients keep the body working properly.

Protein is a nutrient. It is an important building block for muscles, tissues, skin, bones and blood.

- **Animal proteins** include meat, poultry, seafood, dairy and eggs.
- **Plant proteins** include dry beans, dry peas, lentils, chickpeas, soy, nuts and seeds.

Carbohydrates are nutrients. Fibre and starches are types of carbohydrates. Starchy foods are a good source of the energy we need. Starchy foods also provide fibre. When you exercise, your body uses energy from carbohydrates. Fibre is important for digestion and a healthy heart.

Some people choose foods like meat, fish, eggs or dairy products to get the protein their bodies need. Protein comes from plant sources as well as animal sources.

In fact, every plant we eat has at least a little bit of protein in it, and some have a lot – like dry beans, which are also called pulses! Beans are high in minerals and fibre. Adding beans to your food choices can help you feel full longer.

Fats are another type of nutrient. There are many different types of fat. Some fats come from plants and some fats come from animals.

Fat is needed for energy, to keep the body warm, protect organs and for healthy skin and hair. It helps your body absorb important vitamins.

Don't forget about water. **Water** carries nutrients to cells, helps get rid of body waste, regulates our body temperature, protects our organs and more.

Canada's Food Guide encourages a variety of foods.

pulses on the plate

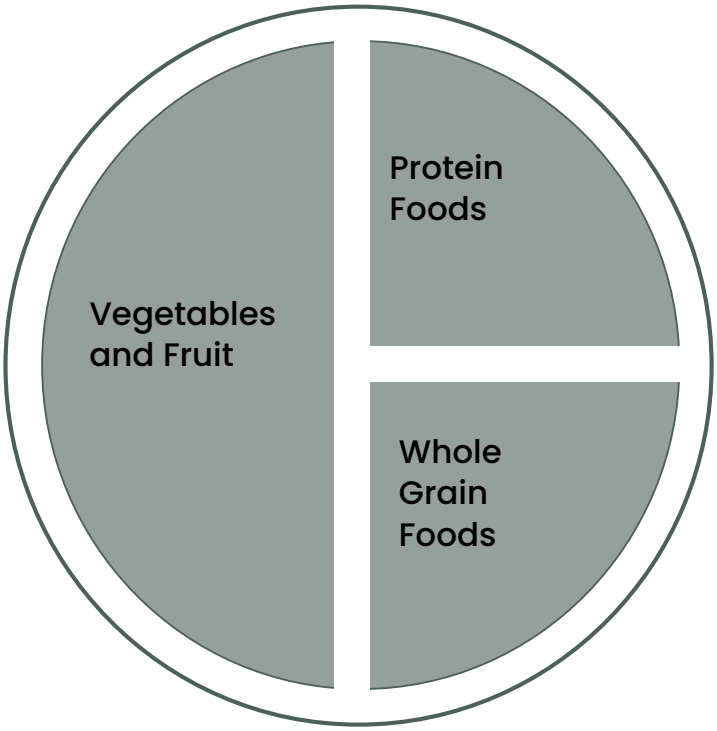
Canada's Food Guide provides balanced choices that ensure you get enough nutrients with the foods that you choose for your meals and snacks.

The **Food Guide Plate** tells you to:

- Fill about half your plate with vegetables and fruits, which provide fibre and many vitamins and minerals that are good for your health
- Fill about one-fourth of your plate with whole grain foods, which give you carbohydrates like fibre
- Fill about one-fourth of your plate with protein foods, including protein foods that come from plants

Pulses provide important vitamins and minerals:

- Iron and B-Vitamins for energy
- Potassium for growth, balancing body fluids and a healthy heart
- Zinc to help you grow and keep you from getting sick



Pulses are high in protein, especially compared to other plant foods.

Pulses have two to three times more protein than grains like rice, corn and wheat. For example, you would have to eat 2 cups of rice or 1 cup of quinoa to get the same amount of protein that is found in half a cup of lentils.

Pulses also provide fibre and starches. For example, one cup of cooked pulses gives you more than half the amount of fibre you need for the entire day.

You would have to eat 2 cups of bran flakes, 4 cups of oatmeal, or 8 slices of whole wheat bread to get the same amount of fibre found in 1 cup of beans.

How can you eat pulses?

- Bake them into muffins or granola bars
- Make hummus with chickpeas
- Make a dip with beans, peas or lentils
- Make a party dip with beans, salsa and avocado
- Put them on pizza or pasta
- Add them to soups
- Add them as a topping for salads or rice bowls
- Make fruit smoothies with beans or lentils
- Use them to make veggie burgers

Have you every heard the expression **"nutrient-dense"** foods? Nutrient-dense foods have lots of vitamins, minerals and other nutrients that everyone's bodies need.

This means that foods like fruits and vegetables, whole grains, fish, lean meat and poultry, dry peas, dry beans, lentils, chickpeas, nuts and seeds are all considered nutrient-dense foods.

Why do you think pulses could be called a "nutrient-dense" food? Use two examples to explain your thinking.

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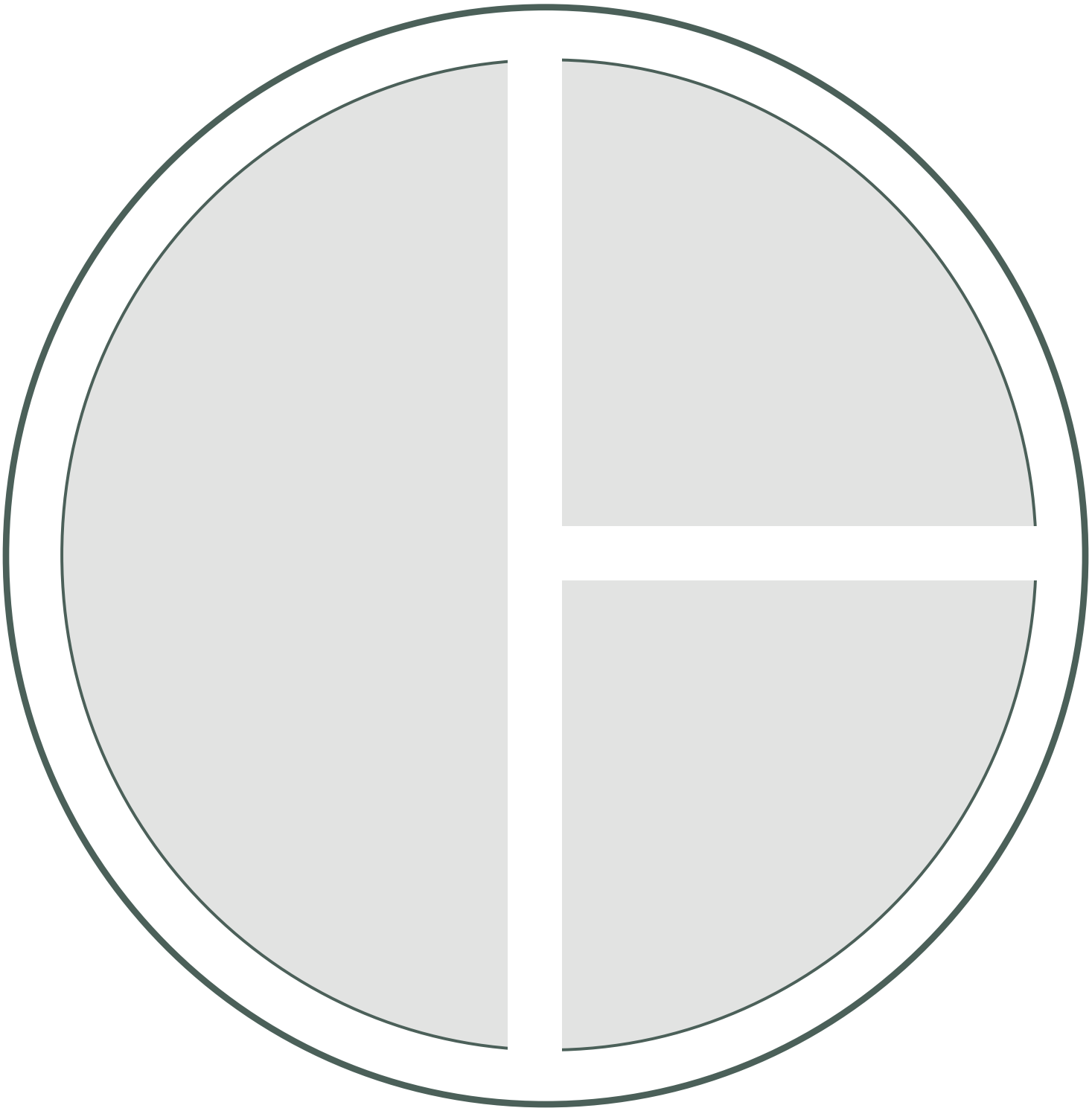
How could you create your own "food guide plate" with suggestions for a variety of food choices? Label each section of the plate on the next page. Include a suggestion for a food with at least one type of pulse on your plate!

food guide plate



Nutrients come from food.

mix it up

You might be surprised at the number and variety of food choices that include pulses! There are recipes for breakfast, lunches, dinners and snacks that use beans, lentils, peas and chickpeas – along with other ingredients that are part of a balanced food guide plate.

Where do the lentils in this recipe come from? This photo shows a close up of a lentil pod in a farmer's field.

You can check out many different recipe ideas on the Alberta Pulse Growers website at **https://albertapulse.com/recipe/**!

Lentil Salsa

Ingredients

2 medium tomatoes, finely diced

1 cup (250 mL) finely chopped onion

1/4 to 1/2 cup (60–125 mL) chopped green, orange, or yellow pepper

1 cup (250 mL) cooked green lentils OR a 14 oz (398 mL) can, drained and rinsed

2 Tbsp (25 mL) finely chopped cilantro

1 Tbsp (15 mL) red wine vinegar

1 Tbsp (15 mL) lime juice

2 cloves garlic, minced

1/8 tsp (0.5 mL) salt, optional

Directions

1. In a large bowl, combine tomatoes, onion, chopped pepper, lentils, cilantro, vinegar, lime juice, garlic and salt, if using. Mix well.

2. Cover and chill for 2–3 hours. Serve at room temperature with crackers or tortilla chips.

TIPS

Lentil purée can be made by draining and rinsing 1 can (19 oz/540 mL) of lentils. Place in a food processor, add 1/2 cup (125 mL) hot water and blend until the mixture is smooth and the consistency of canned pumpkin. Add additional water 1 Tbsp (15 mL) at a time to reach the proper consistency. Unused lentil purée can be stored in an airtight container for 1 to 3 days in the refrigerator or frozen for up to 6 months.

Lentil purée can be used in other baking recipes or added to soups, stews or chili for thickening as well as added protein and fibre.

Do lentils look different when they are ready to be harvested? This photo shows a lentil crop ready for harvest by Fort Saskatchewan, Alberta.

Cranberry Orange Muffins

Ingredients

2 cups (500 mL) all-purpose flour

1 ½ tsp (7 mL) baking powder

dash salt

1/2 cup (125 mL) unsalted margarine

3/4 cup (175 mL) granulated sugar

2 eggs

1 cup (250 mL) lentil purée (see tips)

3/4 cup (175 mL) orange juice

zest of whole orange

1 ¼ cup (300 mL) whole cranberries, fresh or frozen

Directions

1. Preheat oven to 375°F (190°C). Prepare muffin tin with large muffin cup liners or lightly grease sides of tin.
2. In a medium bowl, stir together flour, baking powder and salt.
3. In a mixing bowl, blend together margarine, sugar and eggs. Add lentil purée, orange juice and zest.
4. Fold in dry ingredients until just blended and add cranberries.
5. Spoon mixture into prepared muffin tin, filling cups 3/4 full.
6. Bake 20-25 minutes or until toothpick inserted in center of muffins comes out clean.
7. Remove from oven and let cool in pan for 5-10 minutes, then remove muffins and let cool completely on wire rack.

Chickpea Hummus

Ingredients

1 can (19 oz/540 mL) chickpeas, drained and rinsed (yields 2 cups/500 mL cooked)

1/3 cup (75 mL) tahini

1 clove garlic, minced

1/4 cup (60 mL) fresh lemon juice

3 Tbsp (45 mL) canola oil

1/2 tsp (2 mL) ground cumin

1/2 tsp (2 mL) salt (more or less to taste)

1/3 cup (75 mL) water

1/2 tsp (2 mL) hot pepper sauce

Crackers, naan, pita bread, or fresh veggies for dipping

Directions

1. Place chickpeas in a 4-cup (1 L) blender or food processor with tahini, garlic, lemon juice, oil, cumin and salt.
2. Purée, adding just enough water to make the mixture creamy and smooth. Use more than the 1/3 cup (75 mL) water if needed.
3. Add hot pepper sauce to your liking.
4. Transfer to a bowl and serve with crackers, naan or pita cut into wedges and assorted fresh vegetables.

TIPS

- Hummus makes a great sandwich spread.
- Tahini is a sesame seed paste often found in the international, ethnic or peanut butter section of the grocery store.
- Unsalted, unsweetened peanut butter may replace tahini.

Where do the chickpeas in this recipe come from? This photo shows a chickpea crop ready for harvest by Medicine Hat, Alberta.

TIPS

- This recipe freezes well; portion into airtight containers and freeze for up to 3 months.
- A can (19 oz/540 mL) of mixed beans is a great substitution if you prefer a variety of beans.
- Want more heat? Add a few hot pepper flakes or a dash of Tabasco sauce along with the salsa!

Where do the beans in this recipe come from? This photo shows a farmer harvesting a bean crop near Bow Island, Alberta.

Beans & Rice Master Mix

Ingredients

1 Tbsp (15 mL) canola oil

1 lb (500 g) ground beef, pork, chicken, turkey or crumbled tofu

1/2 cup (125 mL) uncooked, brown rice

2 cloves garlic, minced

1 sweet red or yellow pepper, diced

1 large yellow onion, diced

1 medium zucchini, grated

1 can (19 oz/540 mL) black beans or pinto beans, drained and rinsed (yields 2 cups/500 mL)

1 cup (250 mL) salsa (heat level to taste)

1 ½ cups (375 mL) beef or vegetable broth

1 cup (250 mL) canned or frozen kernel corn

Directions

1. In a large heavy bottomed skillet, heat oil over medium.
2. Brown ground meat or tofu. Add brown rice and cook for 2 minutes.
3. Add garlic, pepper, onion, zucchini and continue cooking, stirring until onion is soft.
4. Stir in beans, salsa and broth, cover and cook until rice is tender, about 15 minutes. Mixture will be thick.
5. Add corn, heat through and serve!
6. Use in wraps, tacos, quesadillas, enchiladas, nachos, chili, soups and more or cool mixture and pack into desired serving sizes and freeze for later use.

What can you learn about science by cooking? Think about how these cooking tips for all pulses use science!

Use unsalted water; salt toughens pulses during cooking.

Tomatoes, vinegar and other acidic ingredients slow the cooking process. Add them once the pulses are tender.

Add seasonings like dry herbs or chopped onion or garlic during cooking to maximize flavours.

Pulses can be found in all kinds of grocery stores. Look for "Product of Canada" on the package labels. If a pulse product in a major retailer is labelled "Product of Canada," the product is likely grown on the Canadian prairies.

How many different foods does it take to make a recipe? Pick one of the recipes and make a list!

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Pick a different recipe! How would you expect this dish to taste if you made it? Sweet, tart, sour, salty? If you made it, was your prediction correct?

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How could these recipes help you fill Canada's Food Guide plate with different types of food and nutrients?

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Pulses are a good choice for different diets.

choices on the menu

Pulses provide many nutrients, including protein, fibre, iron, folate and potassium.

Pulses include a variety of choices – from peas to beans to chickpeas.

Pulses can be used as a meat alternative because they are high in protein.

Pulses can be an important food choice for people with diabetes.

Pulses are high in fibre, low in fat and provide complex carbohydrates.

Combined with the high levels of protein found in pulses, these nutrients help maintain blood sugar levels between meals.

A person who has **diabetes** has a long-lasting health condition that affects how their body turns food into energy.

Pulses are naturally **gluten-free** foods. They provide nutrients that people on gluten-free diets may need. A gluten-free diet avoids wheat and some other grains.

Vegetarians and **vegans** eat more than vegetables. With proper planning, the protein and most of the vitamins and minerals in pulses can replace those found in meat. This can make pulses a valuable part of a vegetarian or vegan diet.

Pulses can be a **meat alternative** for people who follow a vegetarian or vegan meal plan. They can also be used by people who are interested in eating fewer animal proteins.

Combining pulses with whole grains can provide a **complete protein**. Some examples of this are beans and rice or hummus and pita.

A **complete protein** contains all nine essential amino acids that our bodies cannot make on their own. Amino acids are the building blocks of protein.

Did you know that you can use pulse flours in recipes with other flours or gluten-free flours?

Pulses are also a source of iron. Eating pulses with foods that are rich in vitamin C can help the body absorb iron. Some examples might be bell pepper dipped in hummus or a sweet potato and lentil salad.

Nutrient information is found on food labels.

finding nutrients

Food labels are an important part of learning about foods. **Food labels** provide basic information about the nutrients inside foods so that you can learn more about them.

What do you notice about these labels? What is similar? What is different?

Choose three food labels to compare. Use at least one of the pulse labels.

Explore these similarities and differences by filling in their nutrient values in the chart provided on page 18.

These food labels are samples of labels you will find on most food products! Find some of your own labels for other types of foods, like fruits, juices, meats, eggs, other dairy products or different types of cereals.

Cooked Chickpeas

Nutrition Facts

Serving Size 100 grams (½ cup/125 mL)

Amount	% Daily Value / % valeur quotidienne
Calories/ Calories 141	
Fat/ Lipides **2 g**	3%
Saturated/ saturés **0.2 g**	1%
Trans/ trans **0 g**	
Cholesterol **0 mg**	0%
Sodium/ Sodium **6 mg**	0%
Carbohydrate/ Glucides **24 g**	8%
Fibre/ Fibres **4 g**	14%
Sugars/Sucres **4 g**	
Protein/ Protéines **8 g**	
Vitamin A/ Vitamine A	0%
Vitamin C/ Vitamine C	2%
Calcium/Calcium	4%
Iron/ Fer	18%

Dry Peas

Nutrition Facts

Serving Size 100 grams (½ cup/125 mL)

Amount	% Daily Value / % valeur quotidienne
Calories/ Calories 118	
Fat/ Lipides **0 g**	1%
Saturated/ saturés **0 g**	0%
Trans/ trans **0 g**	
Cholesterol **0 mg**	0%
Sodium/ Sodium **2 mg**	0%
Carbohydrate/ Glucides **21 g**	7%
Fibre/ Fibres **8 g**	33%
Sugars/Sucres **3 g**	
Protein/ Protéines **8 g**	
Vitamin A/ Vitamine A	0%
Vitamin C/ Vitamine C	1%
Calcium/Calcium	1%
Iron/ Fer	7%

Cooked Lentils

Nutrition Facts

Serving Size 100 grams (½ cup/125 mL)

Amount	% Daily Value % valeur quotidienne
Calories/ Calories 150	
Fat/ Lipides **0.5 g**	1%
Saturated/ saturés **0 g**	0%
Trans/ trans **0 g**	
Cholesterol **0 mg**	0%
Sodium/ Sodium **5 mg**	0%
Carbohydrate/ Glucides **25 g**	9%
Fibre/ Fibres **4 g**	14%
Sugars/Sucres **0 g**	
Protein/ Protéines **12 g**	
Vitamin A/ Vitamine A	0%
Vitamin C/ Vitamine C	2%
Calcium/Calcium	2%
Iron/ Fer	15%

Plain 2% Greek Yogurt

Nutrition Facts

Serving Size 100 grams (½ cup/125 mL)

Amount	% Daily Value % valeur quotidienne
Calories/ Calories 80	
Fat/ Lipides **2 g**	3%
Saturated/ saturés **1 g**	5%
Trans/ trans **0 g**	
Cholesterol **10 mg**	3%
Sodium/ Sodium **35 mg**	1%
Carbohydrate/ Glucides **5 g**	2%
Fibre/ Fibres **0 g**	0%
Sugars/Sucres **2 g**	
Protein/ Protéines **10 g**	
Vitamin A/ Vitamine A	4%
Vitamin C/ Vitamine C	0%
Calcium/Calcium	10%
Iron/ Fer	0%

Cereal

Nutrition Facts

Serving Size 28 grams (½ cup/125 mL)

Amount	% Daily Value % valeur quotidienne
Calories/ Calories 120	
Fat/ Lipides **1 g**	2%
Saturated/ saturés **0.2 g**	1%
Trans/ trans **0 g**	
Cholesterol **0 mg**	0%
Sodium/ Sodium **170 mg**	7%
Carbohydrate/ Glucides **23 g**	8%
Fibre/ Fibres **3 g**	11%
Sugars/Sucres **5 g**	
Protein/ Protéines **3 g**	
Vitamin A/ Vitamine A	0%
Vitamin C/ Vitamine C	0%
Calcium/Calcium	2%
Iron/ Fer	30%

Milk Chocolate Bar

Nutrition Facts

Serving Size 43 grams (4 squares)

Amount	% Daily Value % valeur quotidienne
Calories/ Calories 220	
Fat/ Lipides **13 g**	20%
Saturated/ saturés **8 g**	40%
Trans/ trans **0.1 g**	
Cholesterol **10 mg**	3%
Sodium/ Sodium **35 mg**	1%
Carbohydrate/ Glucides **25 g**	8%
Fibre/ Fibres **1 g**	4%
Sugars/Sucres **24 g**	
Protein/ Protéines **3 g**	
Vitamin A/ Vitamine A	0%
Vitamin C/ Vitamine C	0%
Calcium/Calcium	8%
Iron/ Fer	8%

food label challenge

	Label 1	Label 2	Label 3 .....
Calories			
Total Fat			
Saturated Fat			
Cholesterol			
Sodium			
Total Carbohydrate			
Fibre			
Sugars			
Protein			
Vitamin A			
Vitamin C			
Calcium			
Iron			

Which of these foods has the most iron? Which has the least?

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Which of these foods has the most protein? Which has the least?

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If you ate all three of these foods in one meal, how much fibre would you eat? How do you know this?

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If you ate all three of these foods in one meal, how much protein would you eat? How do you know this?

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bits and bites challenge

Pick a couple of the mix it up recipes and fill them into the **bits and bites challenge calendar** to try with your family at home! You will need to show your parents or guardians and help with the shopping list! Fill in your calendar with any other meals and healthy eating "bits and bites" you'd like to try. There are some hints filled into the sample calendar as a start!

MON	TUE	WED	THU	FRI	SAT	SUN

Choosing a variety of foods is a daily activity.

Pulses are grown on Alberta farms.

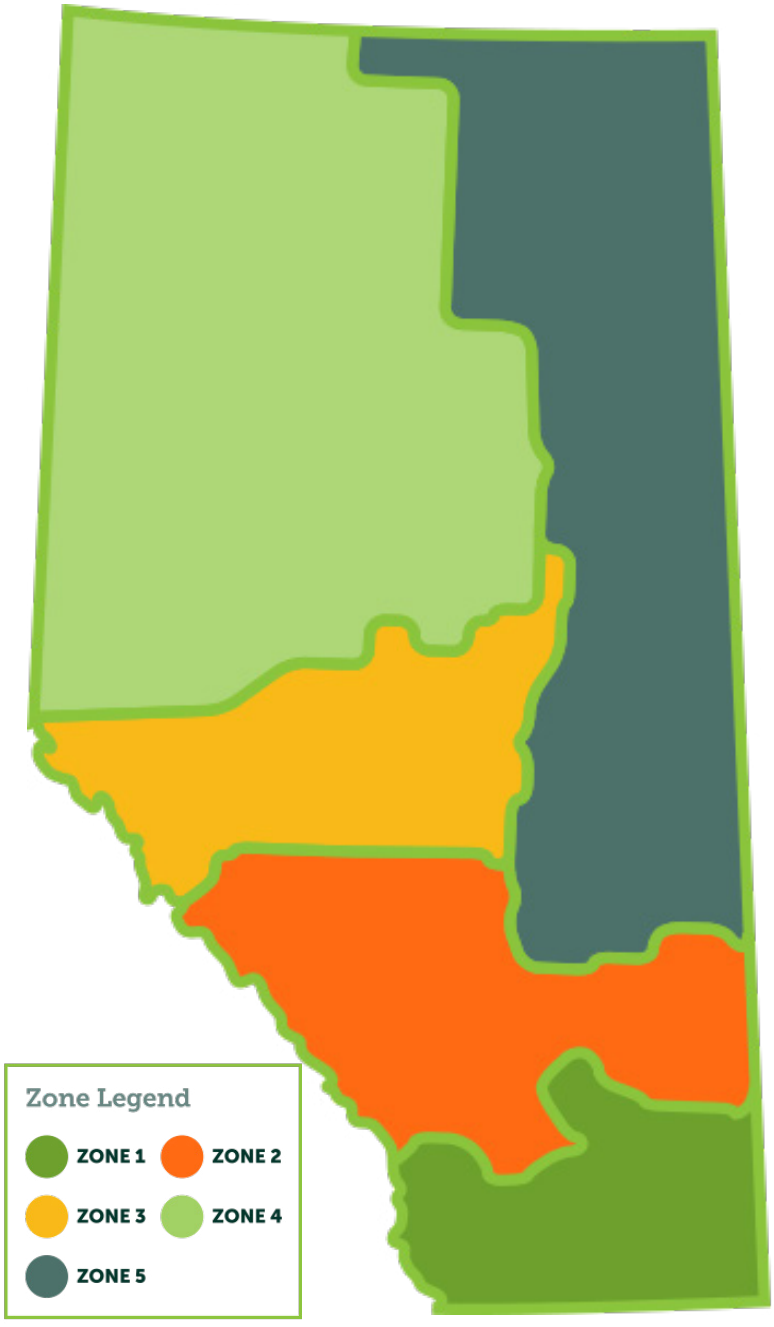
finding pulses

Pulses are crops that are grown for their seeds. Pulses are harvested as a **dry crop** – or when the plants have dried out in the field. This makes pulse crops different from other crops – like vegetables – that are harvested while they are still green.

Pulses are the first crop planted in the spring, usually from late April to late May.

Pulses are also the first crop ready to be harvested, often by late August to late September.

Alberta is divided into **five** pulse growing zones. Different pulses can be found in each zone. These crops may also be grown with different methods, which depend on the land, climate and other resources. Pulses are grown along with other grain crops like canola, wheat and barley.



Which pulse growing zone do you live in? Have you ever seen a pulse crop in the field?

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crop menu

Field peas are the most widely grown pulse crop in Alberta. They are grown in all zones in the province. About 90 percent of the peas grown are yellow peas, while 10 percent are green peas. Most peas are grown in southern Alberta, through central Alberta and in the Peace River region.

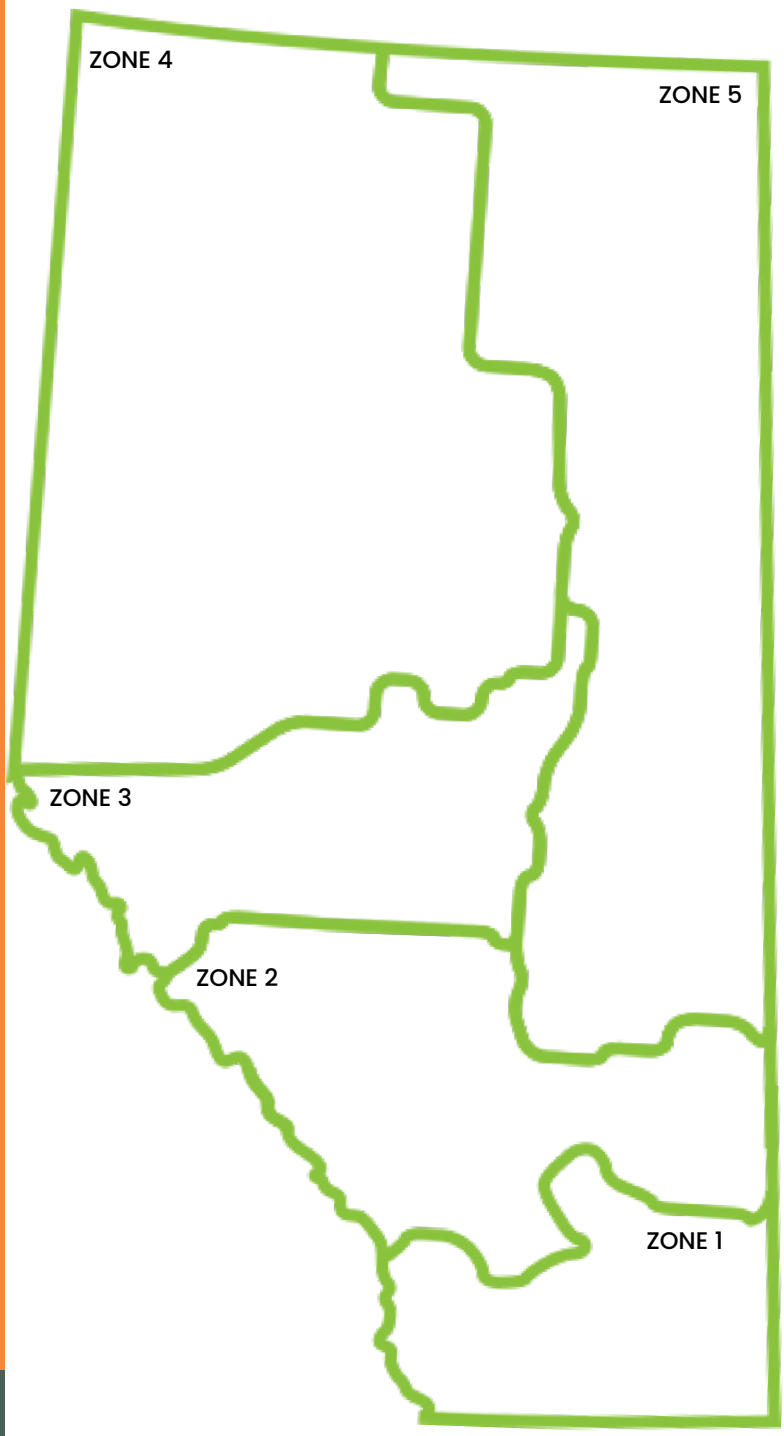
Lentils are grown mainly in zone 1 and zone 2, where the growing season is the longest. A dry climate can also help grow this crop.

Dry beans are grown mainly in zone 1, between Taber, Vauxhall and Bow Island. Irrigation is important to these crops. Dry beans are the third largest pulse crop in Alberta.

Chickpeas are grown in zones 1 and 2. They are the smallest pulse crop in Alberta. Chickpeas need a longer growing season and dry climate.

Faba beans like cooler and moister conditions. They are mainly grown in zones 2, 3 and 5 of the province. Some faba beans are grown in zone 1 but need **irrigation**, or a supply of water brought to the crops. Faba beans may also be found in the Peace River region of zone 4, but the shorter growing season can cause challenges.

Use the information in this crop menu to make a pulse map. Create your own symbols to show the different pulse crops. Check the map legend on the previous page. Label the map with cities and other communities that are important to pulse farming in Alberta.



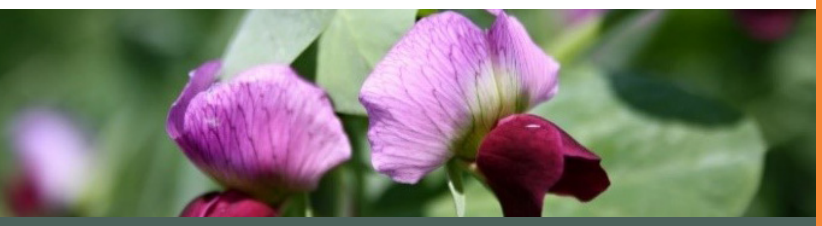
Pulses are good for the environment.

pulses and the environment

Did you know that pulses are closely connected to the soil? The bacteria found in soil are called **soil microbes**.

These microbes work with the pulse plants to pull nitrogen from the air. They turn the nitrogen into nutrients the plant can use. In return, the pulse plant lets the soil microbes eat some of the sugars it makes.

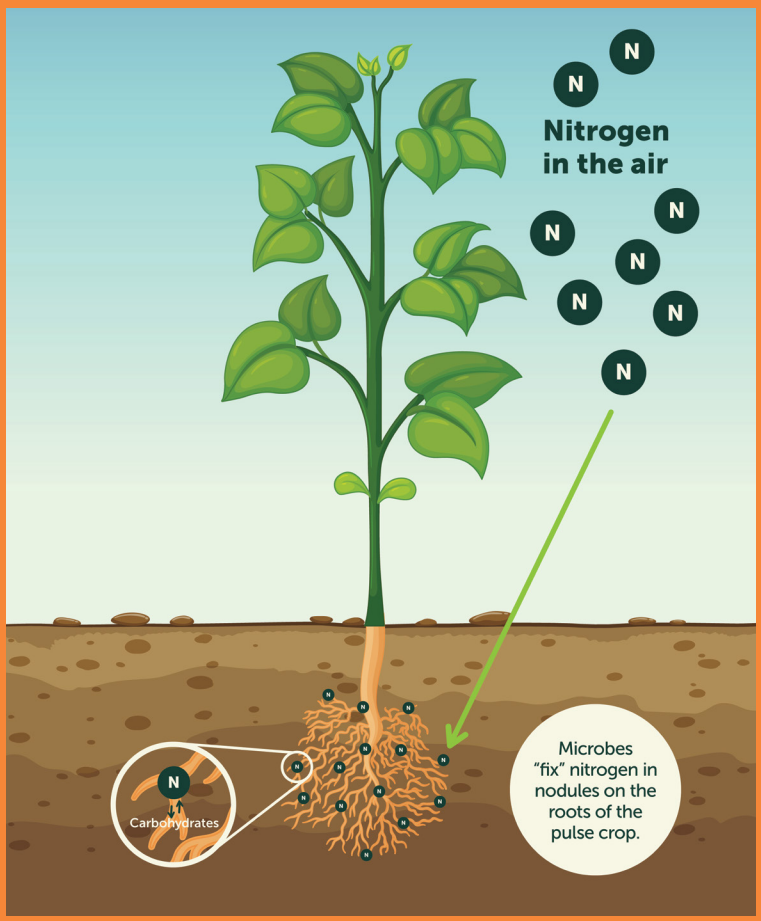
This means that the nutrients in pulse plants are good for the soil. As a result, farmers can use little to no fertilizer. Other crops grown in the same soil the following year benefit from the nutrients left behind by pulses.



Some field peas have purple flowers.

This photo shows a field of lentil plants.

Pulses do not use as much water as other sources of protein. Pulses can be grown in almost any type of climate – wet or dry and cold or hot areas of the world.



pulse farmers

Jerome Isaac lives near Debolt. Together with his family, they run a grain and chicken farm. Yellow peas are a main crop on their family farm. The peas can be planted and harvested earlier than some other crops. This allows Jerome to better manage his harvest in an area of the province that has a shorter growing season.

This photo shows a field of chickpea plants.

This photo shows a bean field in southern Alberta with an irrigation spigot. A **spigot** is like a faucet – it controls a pipe that the water flows through.

Kelisha Archer farms with her husband, her parents, and sister and brother-in-law near Drumheller. They grow cereals, canola and yellow field peas on their land. They have been growing pulses for over ten years because the pulse crops are good for the soil.

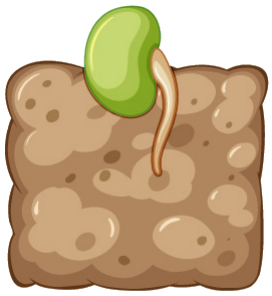
Will Müller grew up in Bow Island and has been part of the family farm all of his life. He has learned to work with many different irrigation systems, crops and equipment that is used on farms in southern Alberta. On the farm with his father and brother, Will grows crops like sugar beets, canola, flax, wheat, mustard, beans, peas and lentils.

Pulse plants have a life cycle.

grow a pulse

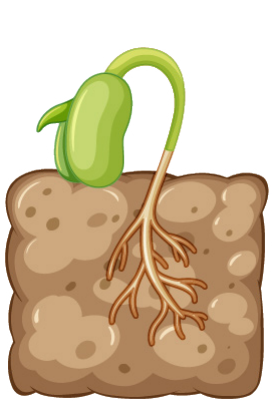
Pulse crops grow in much the same way as other plants. Plants need much the same things as people need to grow. They need nutrients, water, air, the proper temperature and time.

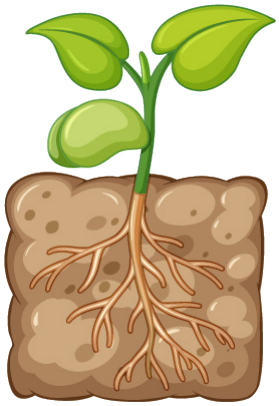
All seeds have an **embryo**. The embryo has a stem, leaves and roots. The seed contains all the nutrients that the embryo needs to survive and grow. When the seed interacts with the soil, water and sunlight it needs, it goes through a growing process called **germination**.



If you watch a bean seed get ready to germinate, you'll see the bean swell a lot from absorbing the water it needs.

Bean plants will poke out of the ground bent over double! This is because the shoot's tip is very sensitive and can be damaged by the soil. The tip is protected because it is pulled out of the soil instead of being pushed out.





When the seed has germinated, the embryo sprouts. The roots grow down into the soil.

Pulses start with two leaves. The leaves trap energy from the sunlight and store it as food. This is called **photosynthesis**.

When the plant has grown enough, flowers form. When the flowers are **pollinated** or fertilized, the seed pods develop. A plant is pollinated when pollen is transferred from one plant to another – usually by bees – so that seeds can be produced.

Most pulse plants are **self-pollinating**. This means they can produce pollen and pollinate themselves. Pulse plants can have one to 12 seeds per pod, depending on the type of pulse plant.

Did you know that bean plants move as they grow? They move their leaves during the day to catch as much sun as possible. They fold their leaves down at night!

Create your own plant life cycle. Select any other crop plant and find out more about how it grows. Show the stages of its growth in the cycle diagram.

How is the life cycle of this crop plant similar to or different from a pulse plant?

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ALBERTA PULSE
GROWERS